Radio-Frequency-Interference Scan at APD, SVNIT

Authors

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Observations

| Observation	obs date	obs time
First Light (FL)	26-08-2019	13:33
Second Thought (ST)	26-08-2019	18:42
Third Bird (THV)	30-08-2019	18:00
Fourth HomeRun (FHR)	31-08-2019	23:04
Fifth Height (FH)	02-09-2019	07:47
Sixth Kite (SK)	02-09-2019	08:29
Seventh Path (SP)	03-09-2019	18:35
Eight Voyager(s)	03-09-2019	19:04
Ninth Cloud (NC)	06-09-2019	17:38
Tenth Wind (TW)	06-09-2019	23:41
Eleventh Thunder (ET)	07-09-2019	02:53
Twelfth Chandryaan (TC)	07-09-2019	04:28
Thirteenth Clue (ThC)	07-09-2019	06:26

Methodology

The run was conducted from `80 MHz` to `300 MHz` with `2 MHz` bandwidth and `1 MHz` overlap, at Applied Physics Department, SVNIT, Surat.

The idea was to remove the initial noise floor of the SDR(Johnson's Noise) from the data to obtain a clean spectrum of RFIs; of course, due to limited noise

data and the variability of environmental factors, the noise floor captured had inherent flaws, but since we were more interested in obtaining a relative radio frequency spectrum, the flaws are present as artifacts should be disregarded.
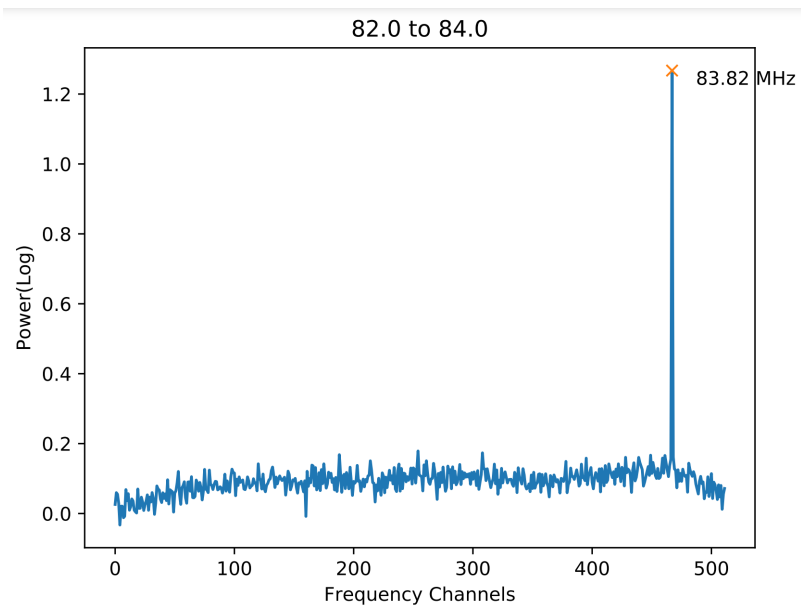
The captured noise floor of the `SDR`:

The `X-Axis` denotes `Frequency channels` and `Y-Axis` denotes `Relative Power(Linear)`.
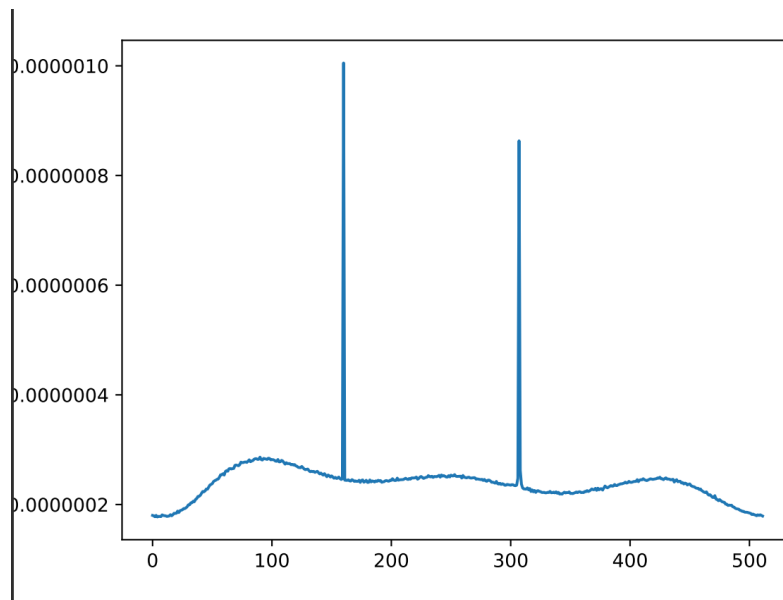

81.0 to 83.0
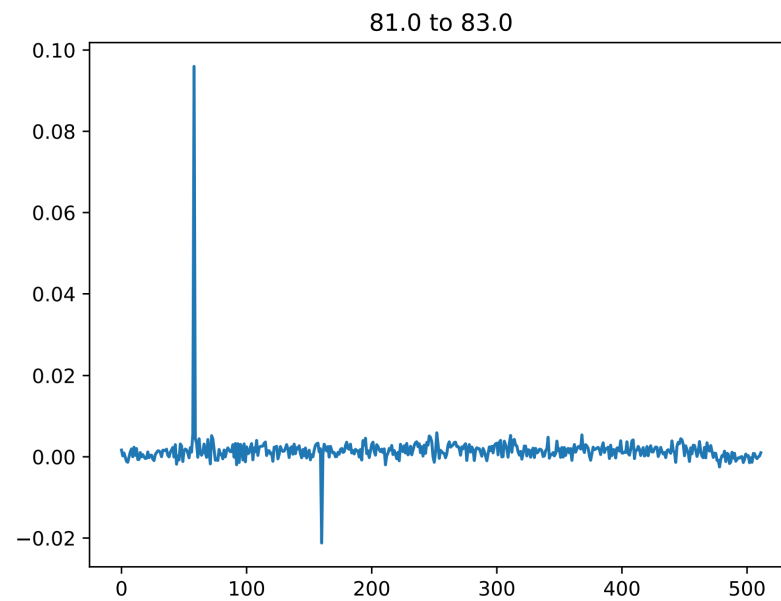
SAS supports both `linear` and `logarithmic` acquisation.

The data after removal of noise looks like: (example from `First Light`)

Due to the scaling of the graph, the noise is not particularly visible, but when we look at something in which the peak is only slightly higher than the noise floor, like:
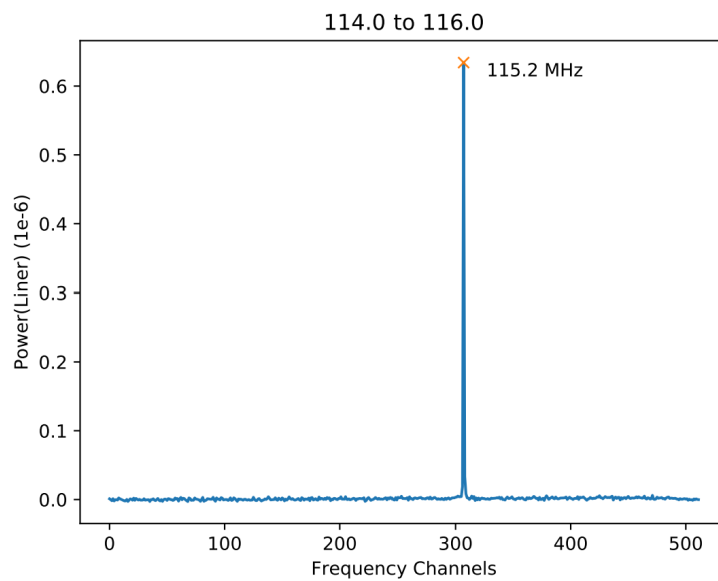

Then the distinction between the actual RFI and the Noise Floor becomes challenging to make, here we can make use of our Noise Floor data, after removing NF, the obtained spectrum looks like:

The absolute value of power is of less importance than the relative power for us here.
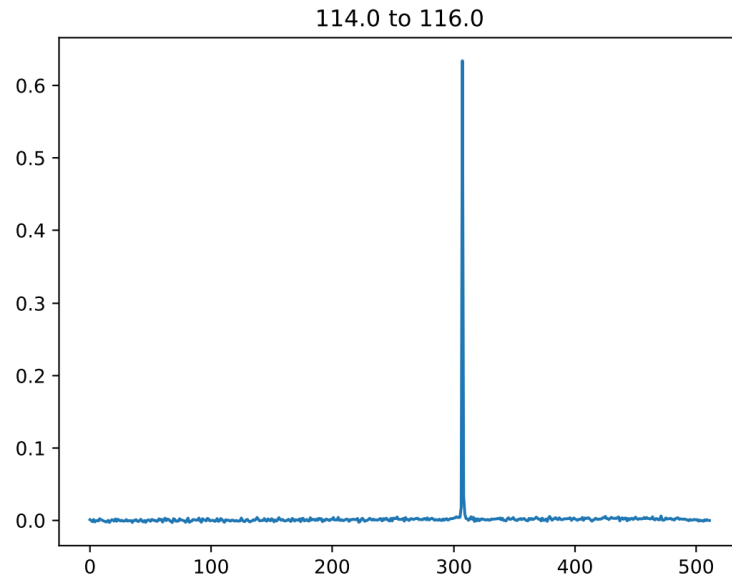
And, finally on using the `peak finder` program, the result obtained are:

Credits

Data acquired using SAS which internally uses rtl-power-fftw.